

FIG. 1

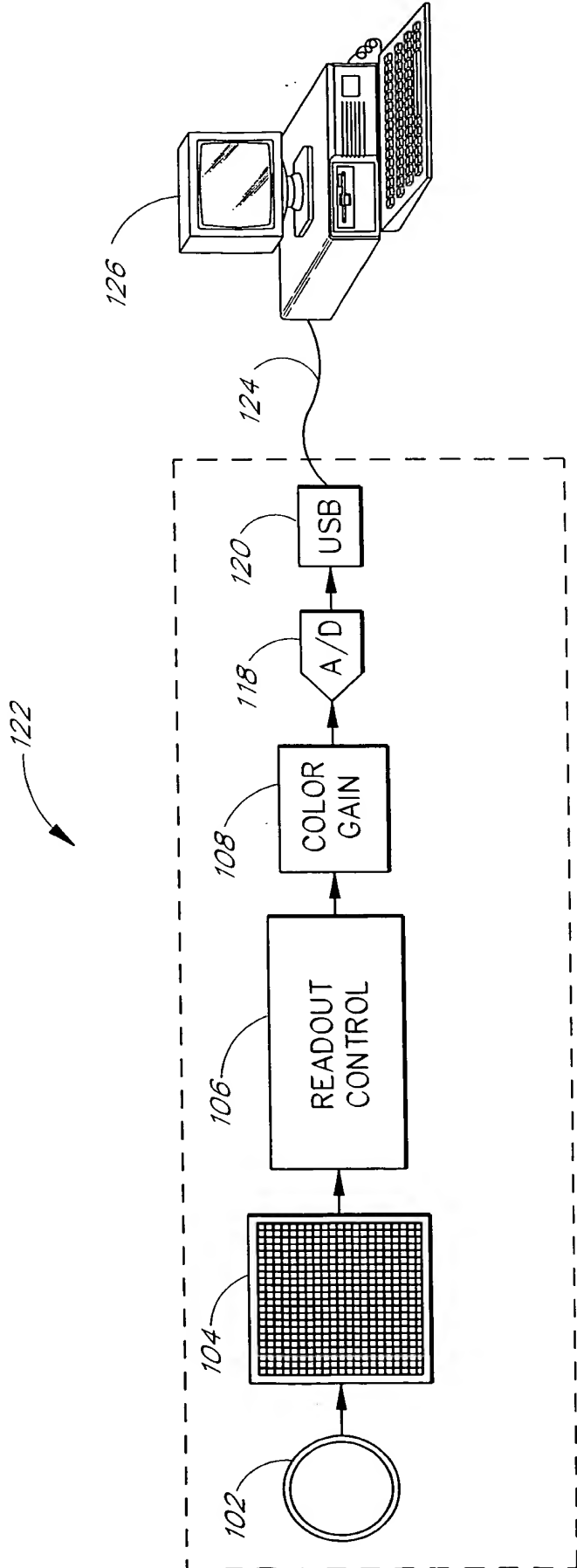


FIG. 2

A 6x6 grid of colored squares. The colors are arranged in a repeating 2x2 pattern of 3x3 blocks. The top-left 3x3 block contains Red (R) and Green (G) squares. The top-right 3x3 block contains Green (G) and Blue (B) squares. The bottom-left 3x3 block contains Blue (B) and Red (R) squares. The bottom-right 3x3 block contains Red (R) and Green (G) squares. The grid is labeled with 130 (pointing to the top-right corner), 132 (pointing to the top-left corner), 134 (pointing to the top-middle), 136 (pointing to the middle-left), and 138 (pointing to the top-middle).

R	G	R	G	R	G
G	B	G	B	G	B
R	G	R	G	R	G
G	B	G	B	G	B
R	G	R	G	R	G
G	B	G	B	G	B

FIG. 3

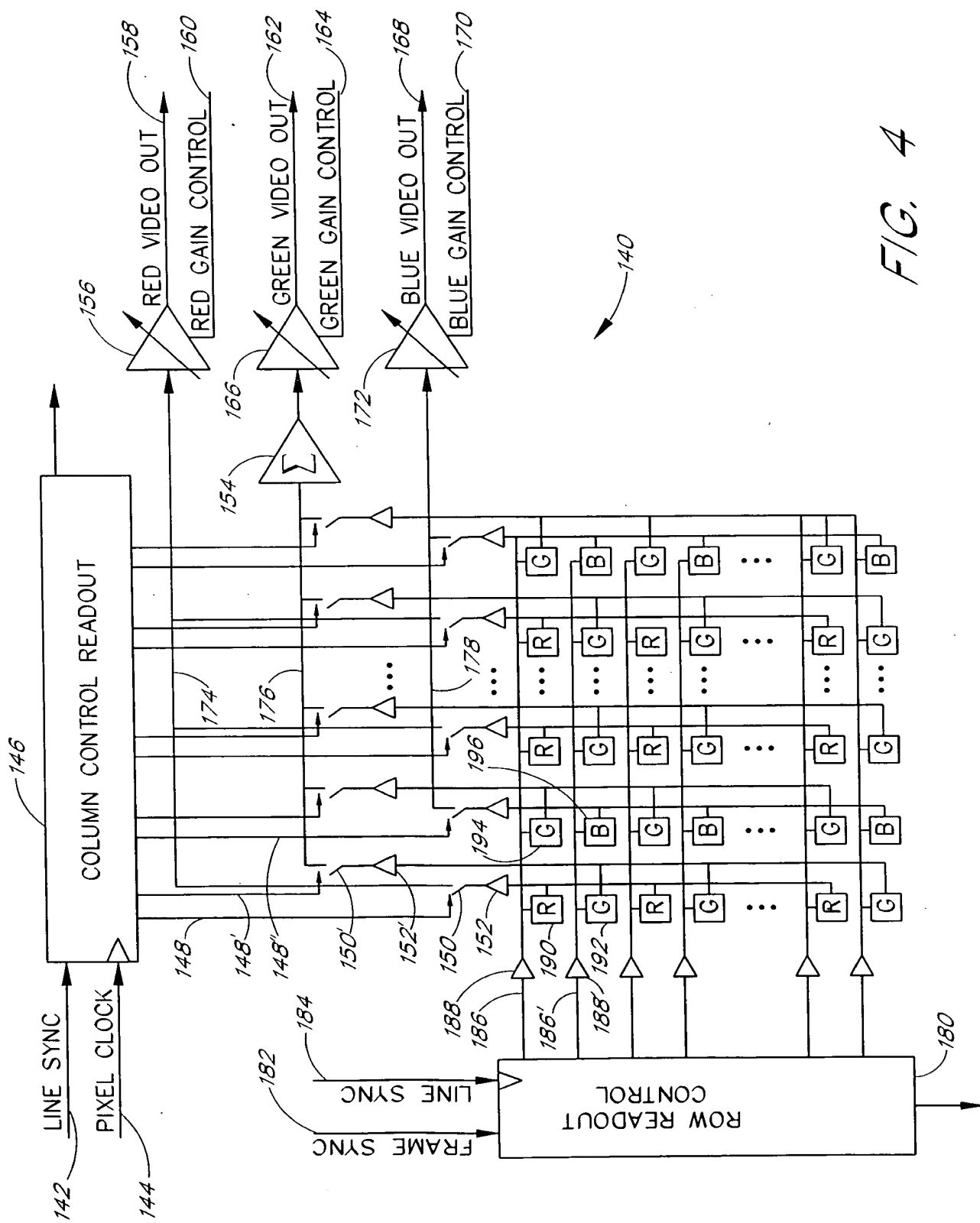


FIG. 4



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graph TD
    202[READ 2x2 PIXEL BLOCK:  
[RG  
GB] OR [GR  
BG] OR [GB  
RG] OR [BG  
GR]] --> 204
    subgraph 203 [ ]
        204([AMPLIFY & OUTPUT  
RED VALUE]) --> 206([SUM TWO GREEN PIXELS])
        206 --> 208([AMPLIFY & OUTPUT  
GREEN VALUE])
        208 --> 210([AMPLIFY & OUTPUT  
BLUE VALUE])
    end
    210 --> 212[ADVANCE TO NEXT COLUMN:  
COLUMN=COLUMN+1]
    212 --> 214{EXCEEDING LAST RED  
PIXEL IN A ROW  
?}
    214 -- NO --> 202
    214 -- YES --> 216[ADVANCE TO NEXT ROW:  
ROW=ROW+1]
    216 --> 218{EXCEEDING LAST ROW  
WITH RED IN A FRAME  
?}
    218 -- NO --> 202
    218 -- YES --> 220[/STOP/]

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FIG. 6

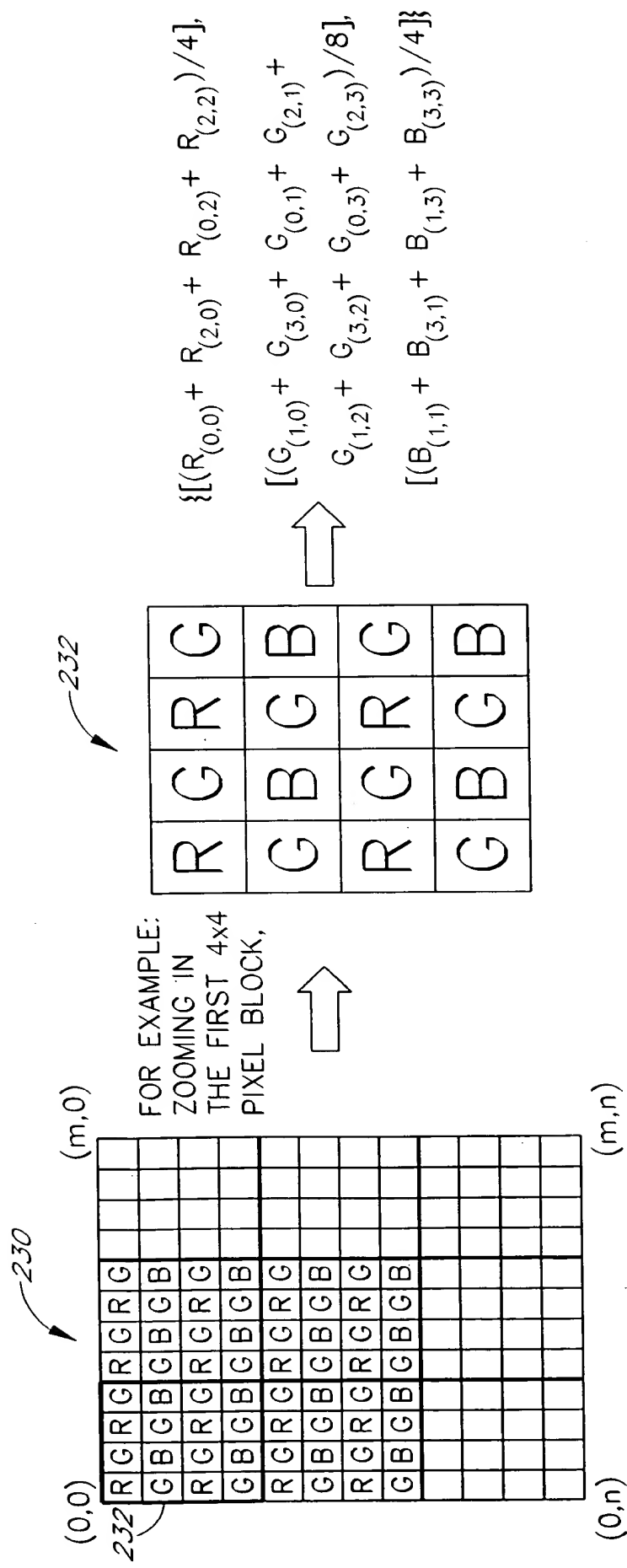


FIG. 7

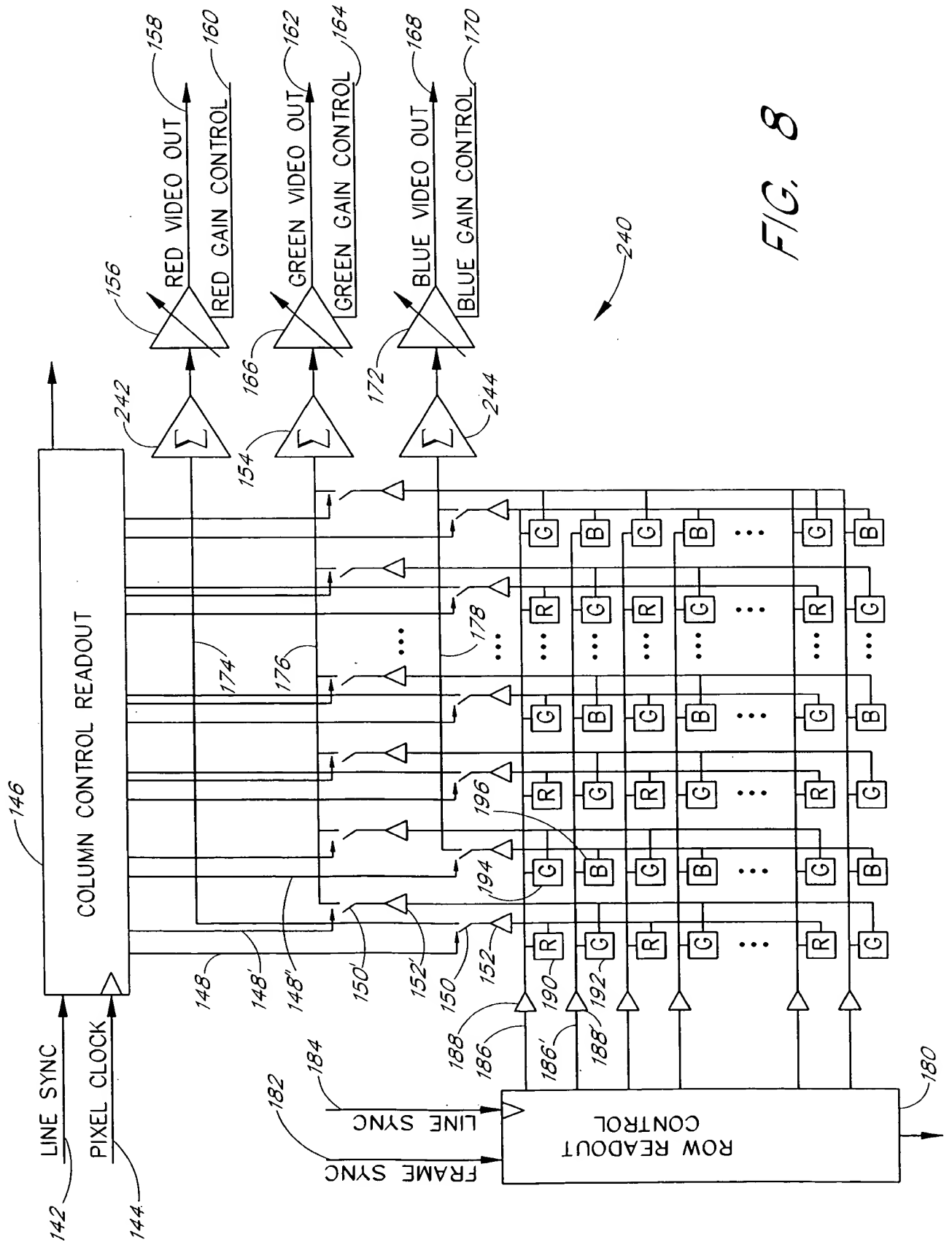


FIG. 8



002020 1.2656460

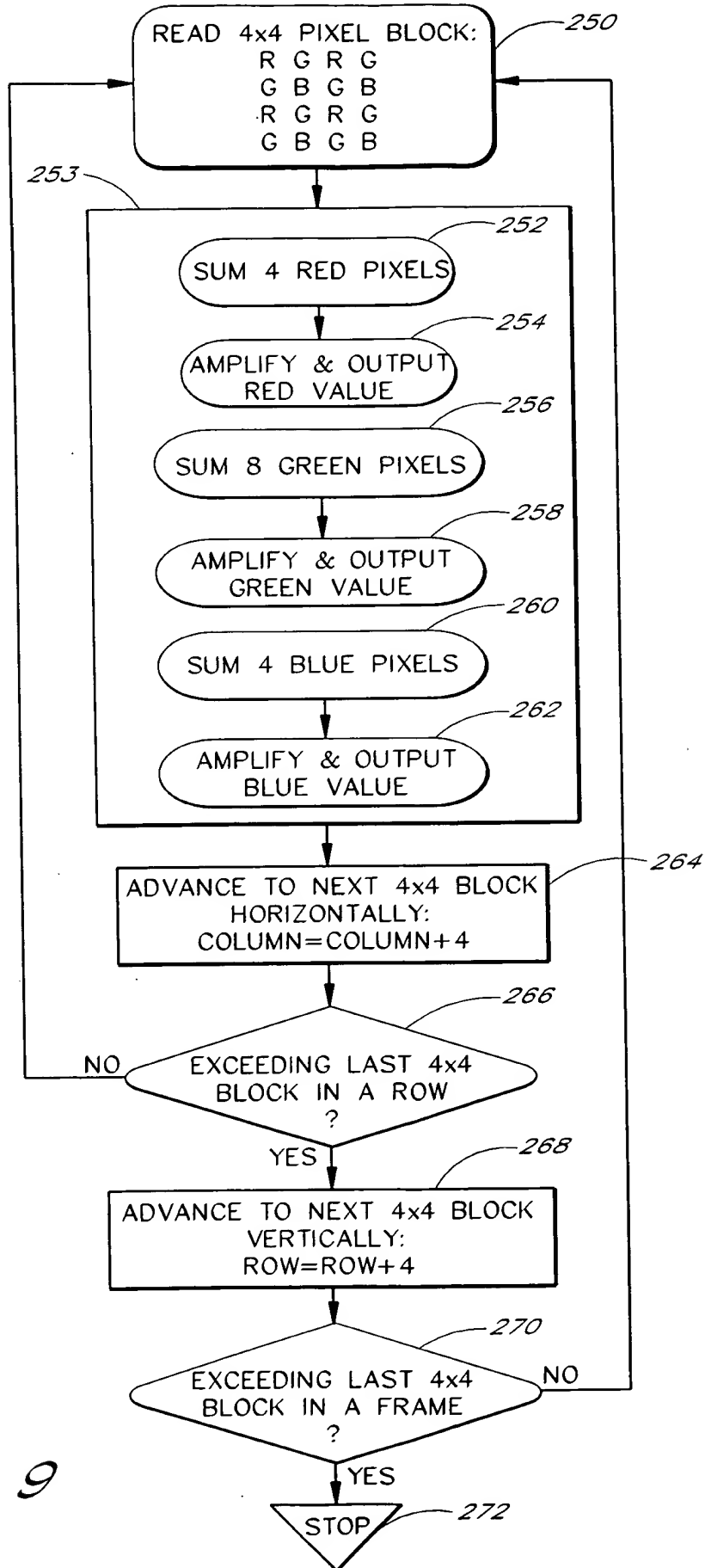


FIG. 9



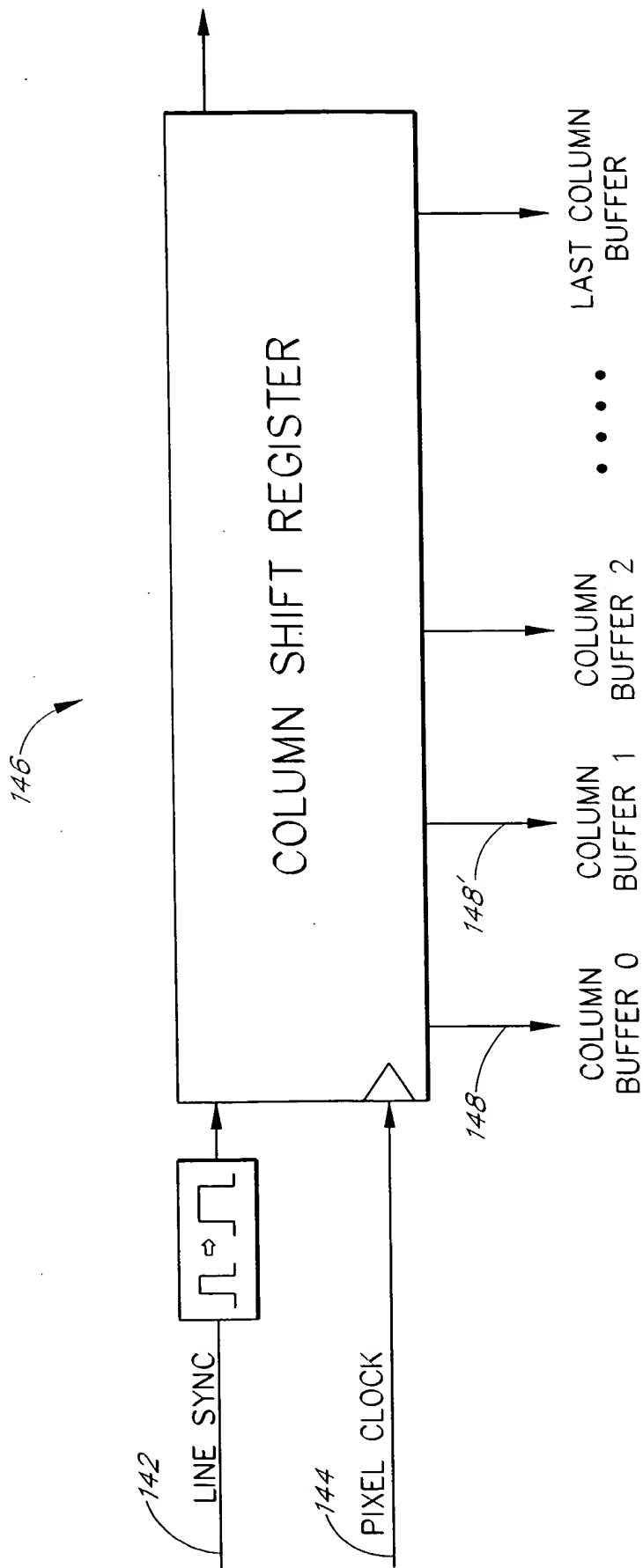
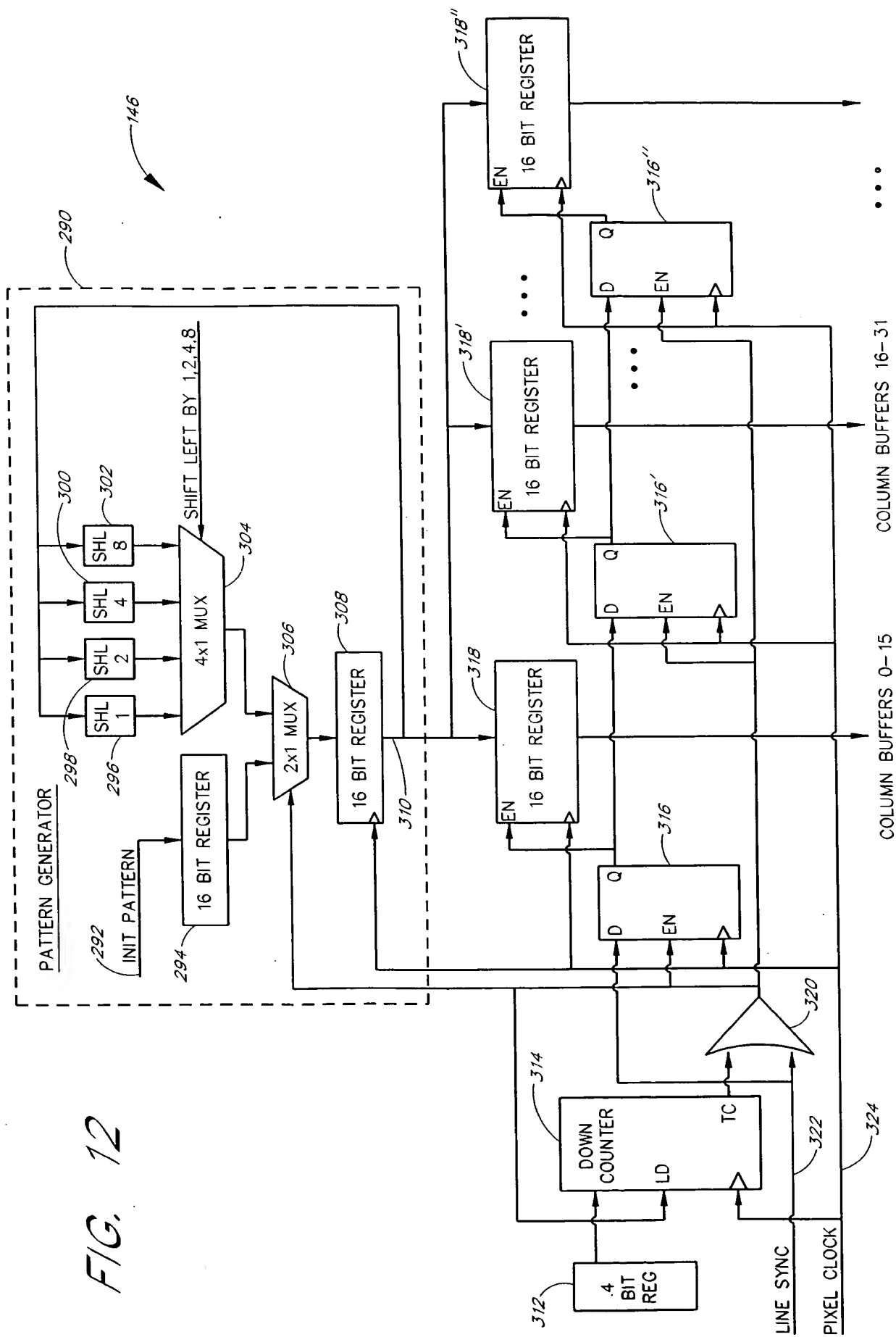


FIG. 11

FIG. 12



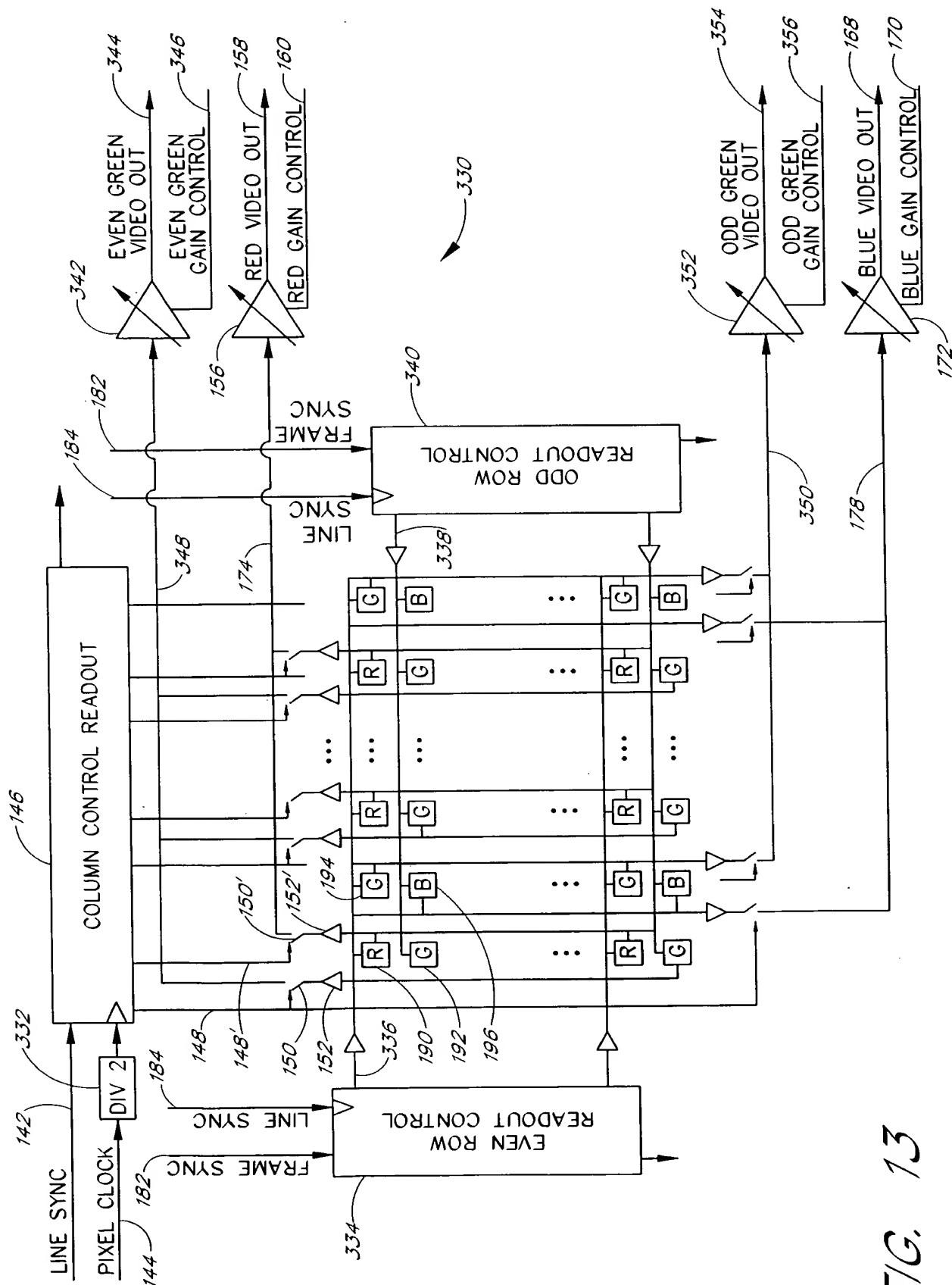


FIG. 13

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graph TD
    360([READ ONE PIXEL VALUE]) --> 363
    subgraph 363 [ ]
        362{RED PIXEL} --> 364[USE THE RED OUTPUT PATH  
AMPLIFY VALUE VIA RED GAIN AMPLIFIER  
OUTPUT RED VALUE]
        368{GREEN EVEN PIXEL} --> 366[USE THE GREEN EVEN OUTPUT PATH  
AMPLIFY VALUE VIA GREEN EVEN GAIN AMPLIFIER  
OUTPUT GREEN EVEN VALUE]
        372{GREEN ODD PIXEL} --> 370[USE THE GREEN ODD OUTPUT PATH  
AMPLIFY VALUE VIA GREEN ODD GAIN AMPLIFIER  
OUTPUT GREEN EVEN VALUE]
        374[USE THE BLUE OUTPUT PATH  
AMPLIFY VALUE VIA BLUE GAIN AMPLIFIER  
OUTPUT BLUE VALE]
    end
    363 --> 376[ADVANCE TO NEXT COLUMN:  
COLUMN=COLUMN+1]
    376 --> 378{EXCEEDING LAST  
PIXEL IN A ROW  
?}
    378 -- NO --> 360
    378 -- YES --> 380[ADVANCE TO NEXT ROW:  
ROW=ROW+1]
    380 --> 382{EXCEEDING LAST ROW  
IN A FRAME  
?}
    382 -- NO --> 360
    382 -- YES --> 384[/STOP/]

```

FIG. 14

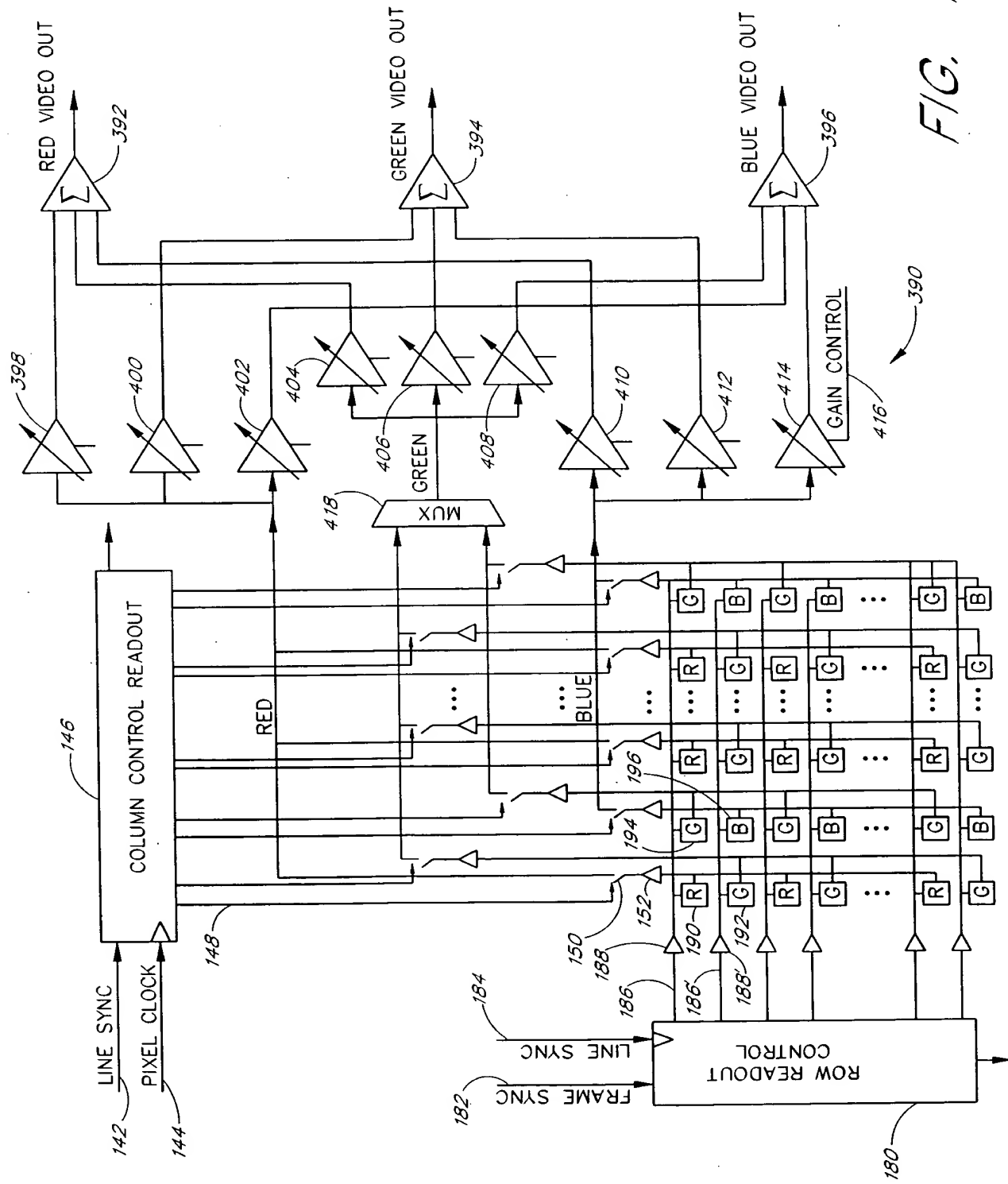
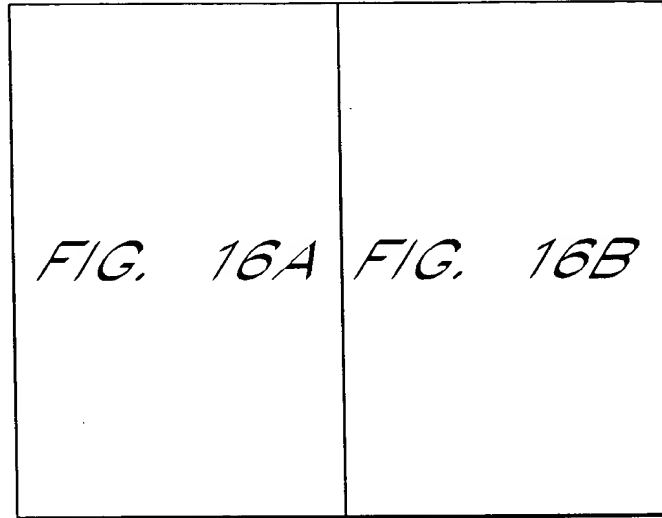


FIG. 15



*FIG. 16*



- 420

/

-424

-426

-428

- 432

40

47

44

4

3

— No

FIG. 16A

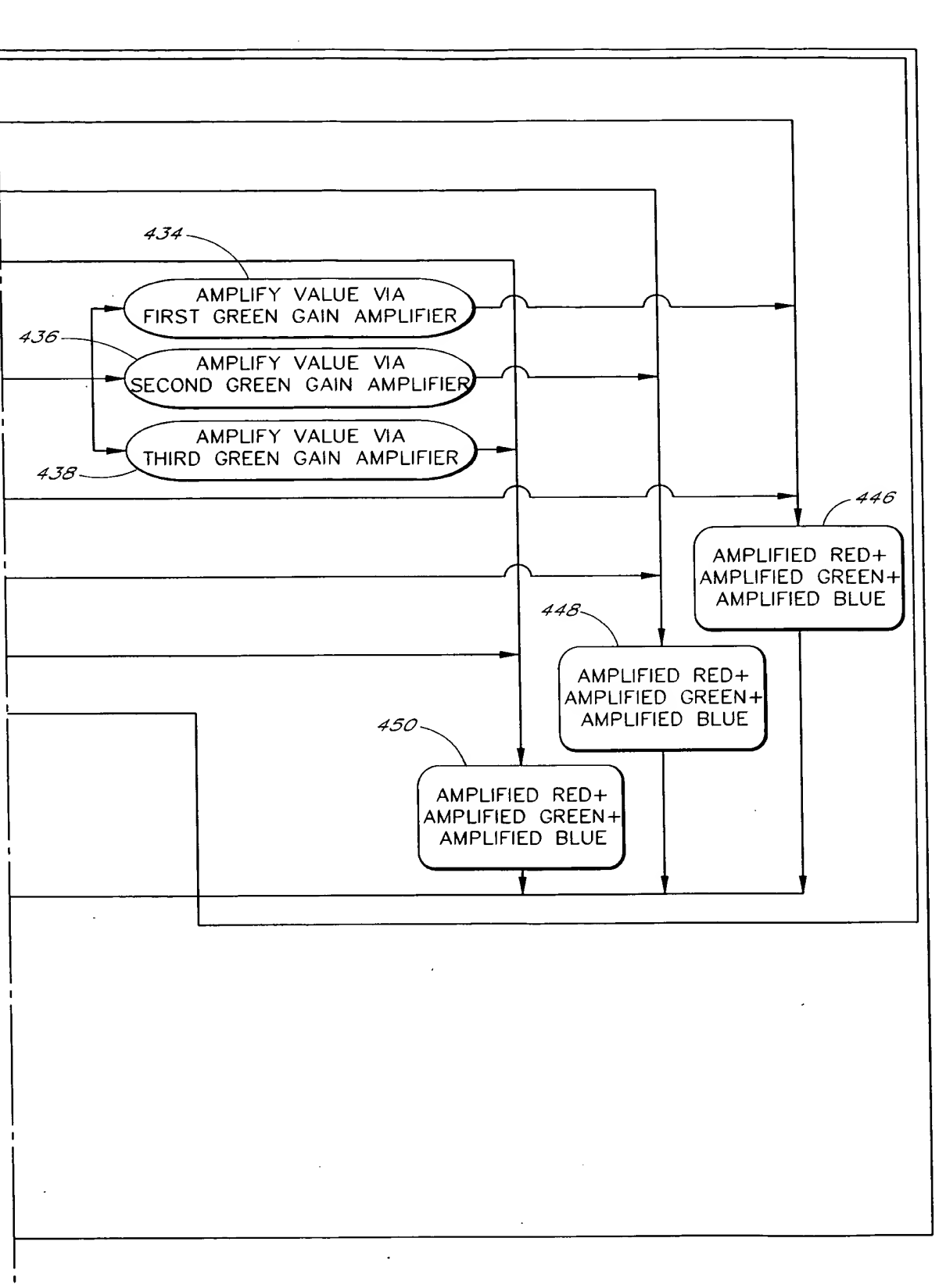


FIG. 16B

002020 T2656460

000000 12656460

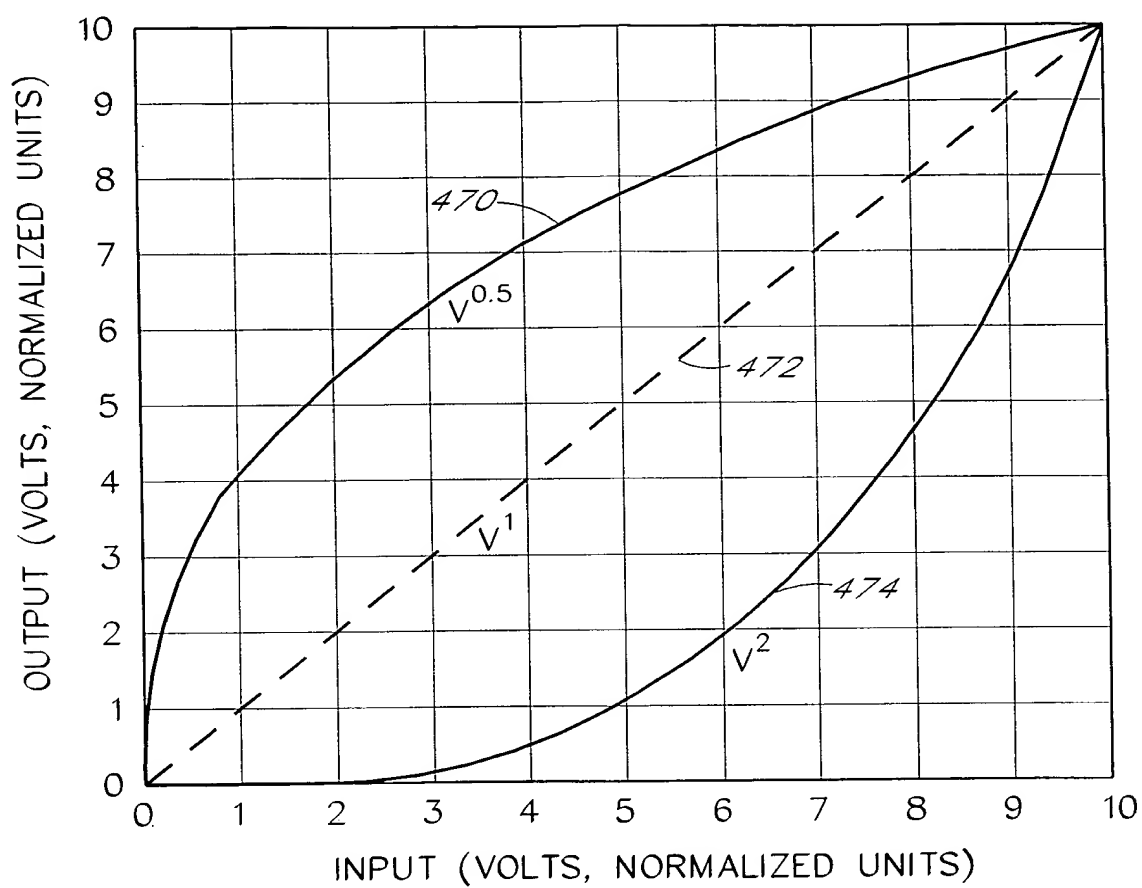


FIG. 17

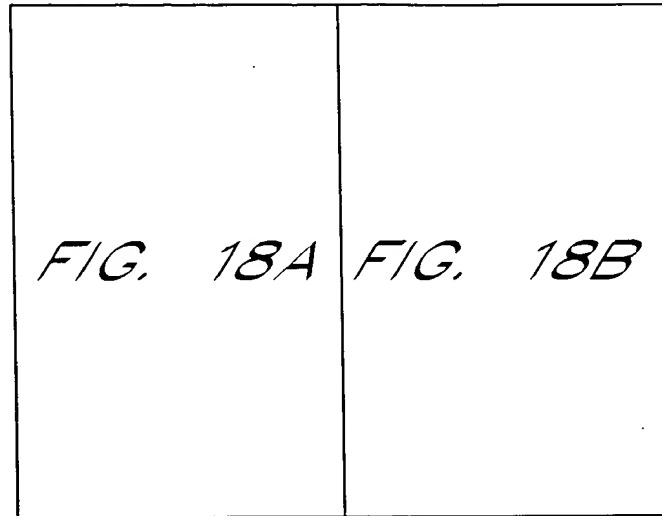


FIG. 18

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graph TD
    Start([START]) --> ReadBlock[READ 2x2 PIXEL BLOCK:  
RG or GR or GB or BG  
GB BG RG GR]
    ReadBlock --> IsRed{RED PIXEL}
    IsRed --> AmpRed1[AMPLIFY VALUE VIA  
FIRST RED GAIN AMPLIFIER]
    IsRed --> AmpRed2[AMPLIFY VALUE VIA  
SECOND RED GAIN AMPLIFIER]
    IsRed --> AmpRed3[AMPLIFY VALUE VIA  
THIRD RED GAIN AMPLIFIER]
    IsRed --> IsGreen{GREEN PIXEL}
    IsGreen --> AvgGreen[AVERAGE TWO GREEN PIXELS  
VIA SUMMING AMPLIFIER:  
(G1 + G2)/2]
    IsGreen --> IsBlue{BLUE PIXEL}
    IsBlue --> AmpBlue1[AMPLIFY VALUE VIA  
FIRST BLUE GAIN AMPLIFIER]
    IsBlue --> AmpBlue2[AMPLIFY VALUE VIA  
SECOND BLUE GAIN AMPLIFIER]
    IsBlue --> AmpBlue3[AMPLIFY VALUE VIA  
THIRD BLUE GAIN AMPLIFIER]
    IsRed --> IsGreen
    IsGreen --> IsBlue
    IsBlue --> AdvanceCol[ADVANCE TO NEXT COLUMN:  
COLUMN=COLUMN+1]
    AdvanceCol --> ExceedsRow{EXCEEDING LAST RED  
PIXEL IN A ROW  
?}
    ExceedsRow -- NO --> ReadBlock
    ExceedsRow -- YES --> AdvanceRow[ADVANCE TO NEXT ROW:  
ROW=ROW+1]
    AdvanceRow --> ExceedsFrame{EXCEEDING LAST ROW  
WITH RED IN A FRAME  
?}
    ExceedsFrame -- NO --> ReadBlock
    ExceedsFrame -- YES --> Stop([STOP])
  
```

FIG. 18A

FIG. 18A

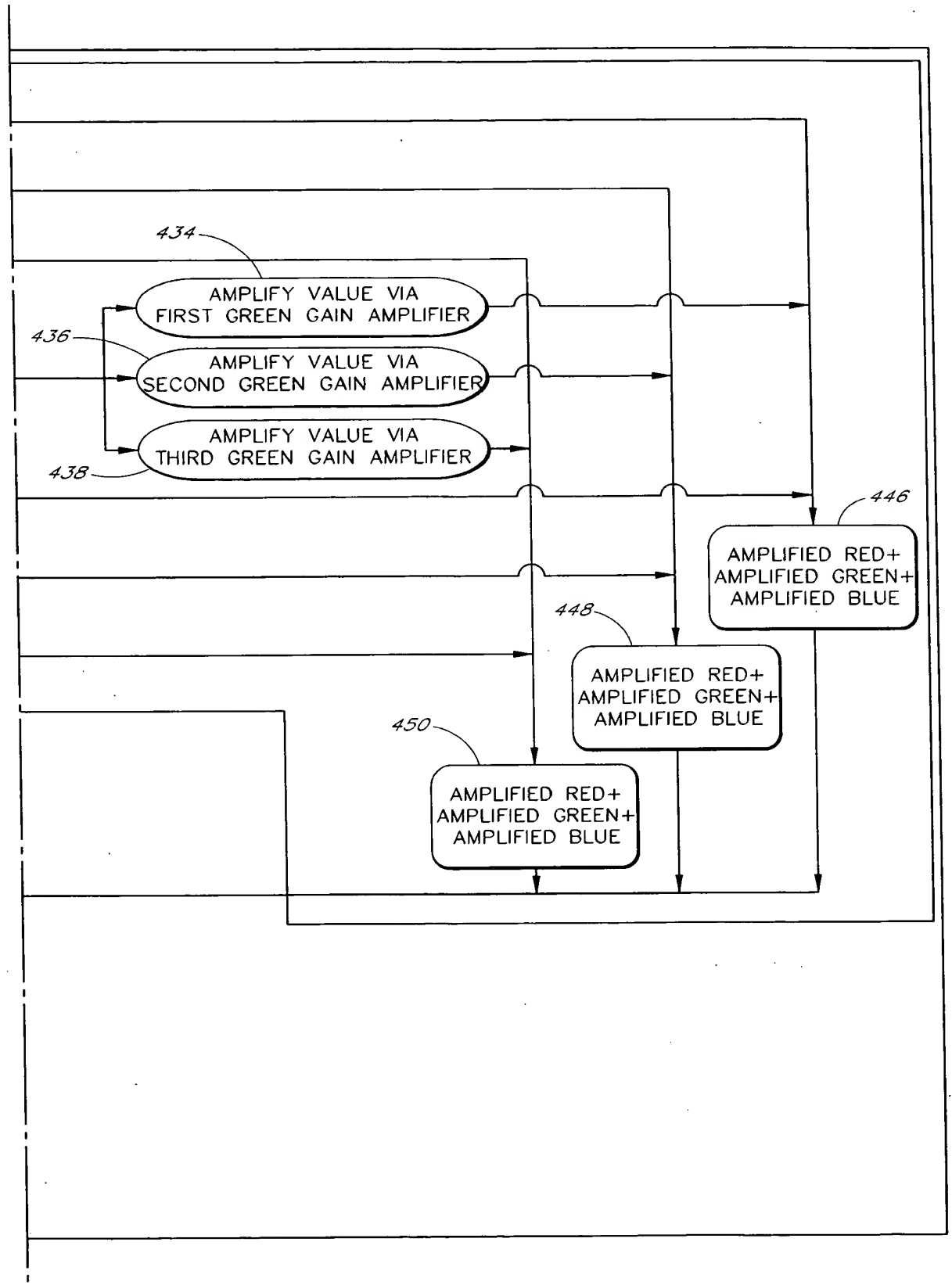
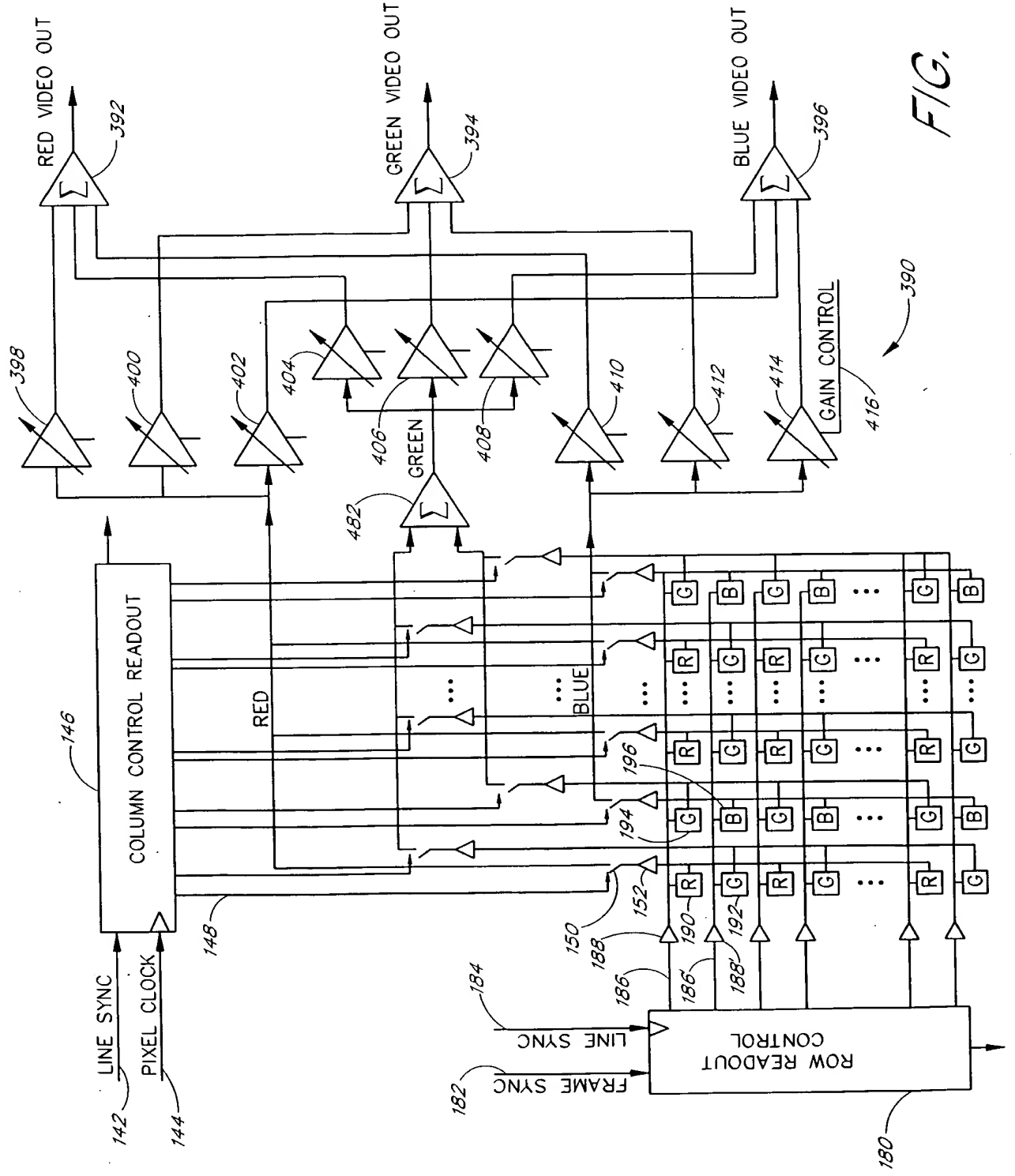


FIG. 18B



The diagram illustrates a video camera system 500. It begins with an image pickup device 142, which outputs signals to a row readout shift register 180 and a column readout shift register 146. The row readout shift register 180 is controlled by frame sync 182 and line sync 186, and outputs row readout signals 188' through 196. The column readout shift register 146 is controlled by line sync 142 and pixel clock 144, and outputs column readout signals 148 through 150. These signals are combined in a subtraction by summing block 490, which also receives dark row readout control signals 504, 504', and 504''. The output of the subtraction block 490 is then amplified by a program gain amplifier 502 to produce the final video output 502. The system also includes a dark row readout control block 182 and a frame sync input 186.

FIG. 20



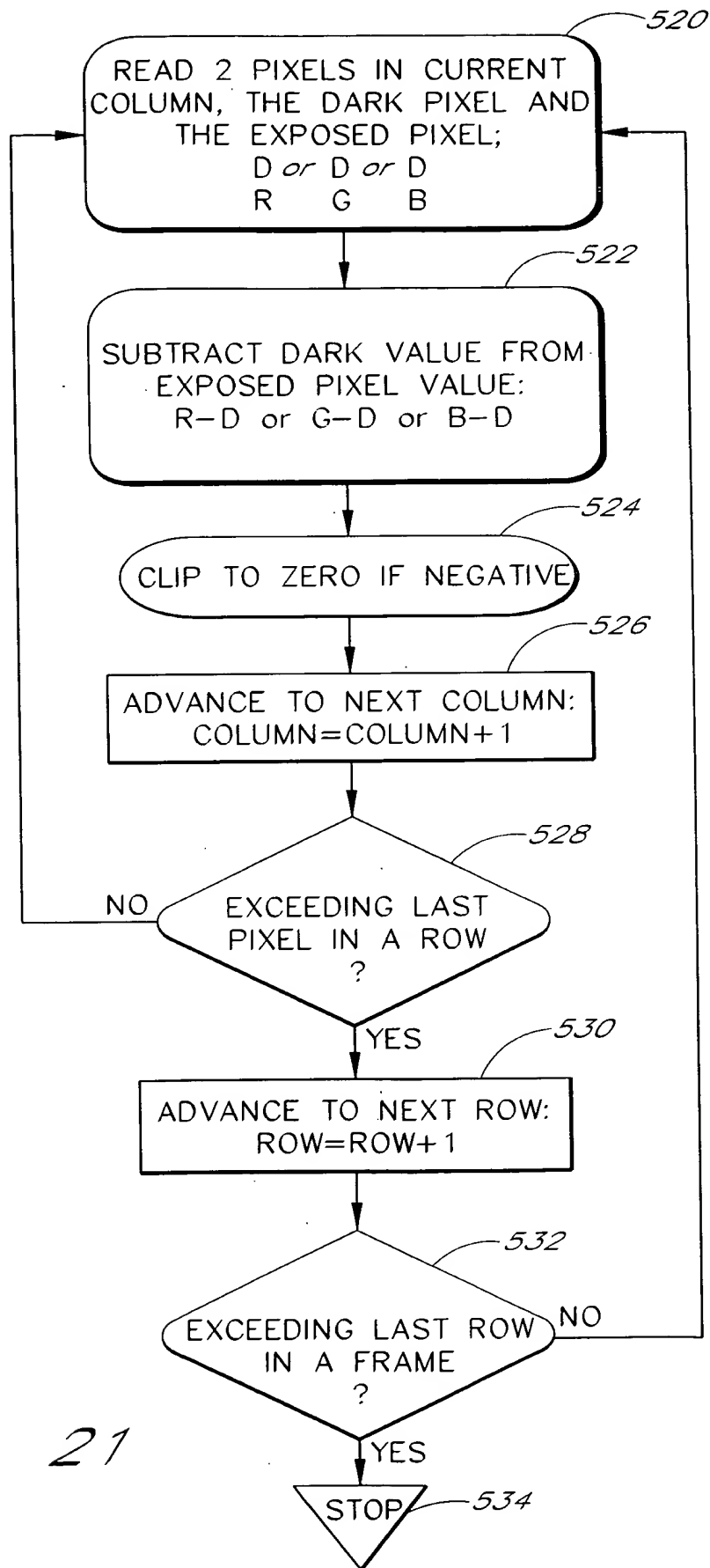


FIG. 21

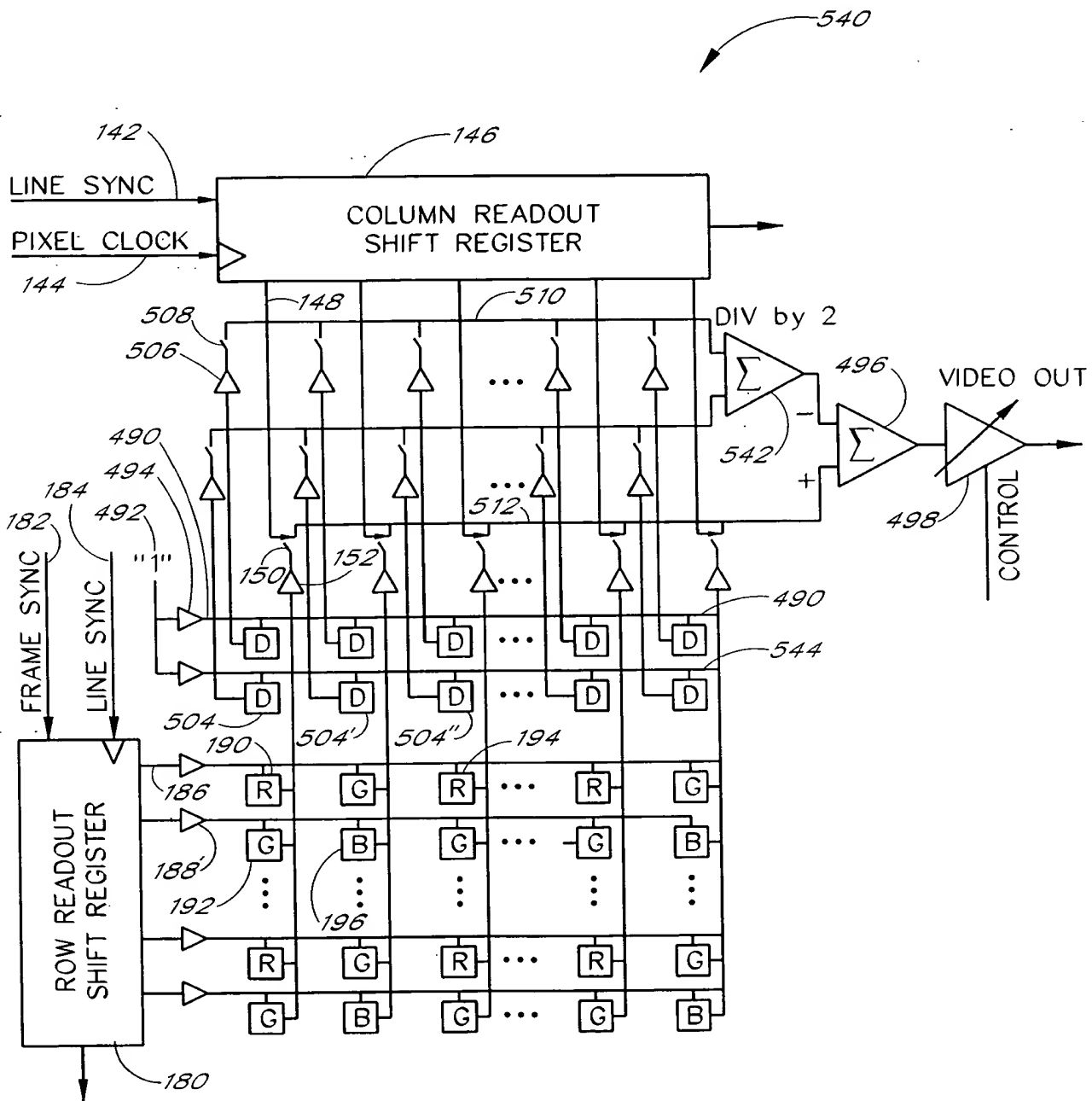


FIG. 22

```
graph TD
    550[READ 3 PIXELS IN CURRENT COLUMN, 2 DARK PIXELS AND THE EXPOSED PIXEL:  
D1 D1 D1  
D2 D2 D2  
R G B] --> 552[AVERAGE TWO DARK PIXELS:  
AD=(D1+D2)/2]
    552 --> 554[SUBTRACT AVERAGE DARK VALUE FROM EXPOSED PIXEL VALUE:  
R-AD or G-AD or B-AD]
    554 --> 556[CLIP TO ZERO IF NEGATIVE]
    556 --> 558[ADVANCE TO NEXT COLUMN:  
COLUMN=COLUMN+1]
    558 --> 560{EXCEEDING LAST PIXEL IN A ROW ?}
    560 -- NO --> 550
    560 -- YES --> 562[ADVANCE TO NEXT ROW:  
ROW=ROW+1]
    562 --> 564{EXCEEDING LAST ROW IN A FRAME ?}
    564 -- NO --> 550
    564 -- YES --> 566[/STOP/]
    style 550 fill:#fff,stroke:#000,stroke-width:1px
    style 552 fill:#fff,stroke:#000,stroke-width:1px
    style 554 fill:#fff,stroke:#000,stroke-width:1px
    style 556 fill:#fff,stroke:#000,stroke-width:1px
    style 558 fill:#fff,stroke:#000,stroke-width:1px
    style 560 fill:#fff,stroke:#000,stroke-width:1px
    style 562 fill:#fff,stroke:#000,stroke-width:1px
    style 564 fill:#fff,stroke:#000,stroke-width:1px
    style 566 fill:#fff,stroke:#000,stroke-width:1px
```

FIG. 23

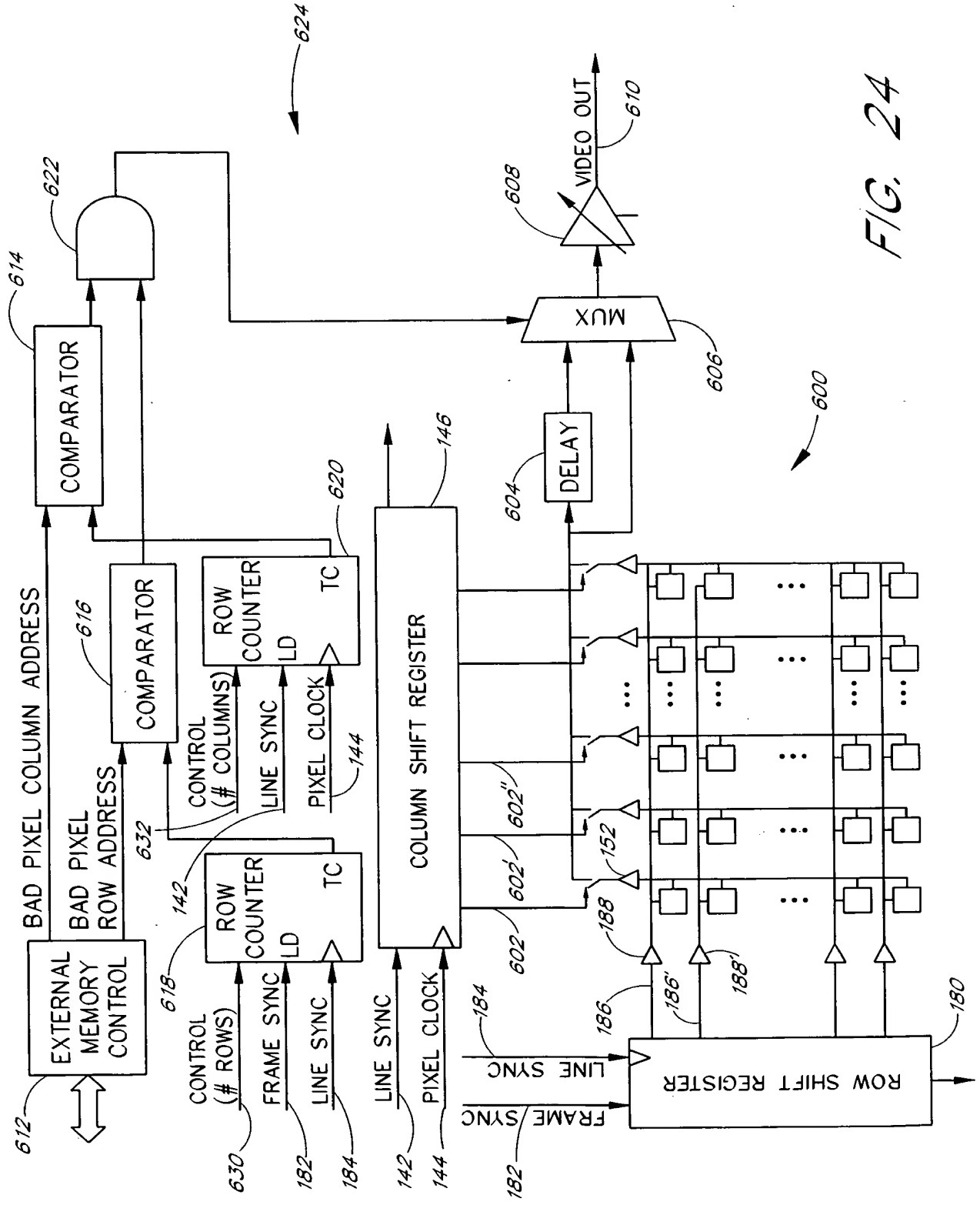


FIG. 24

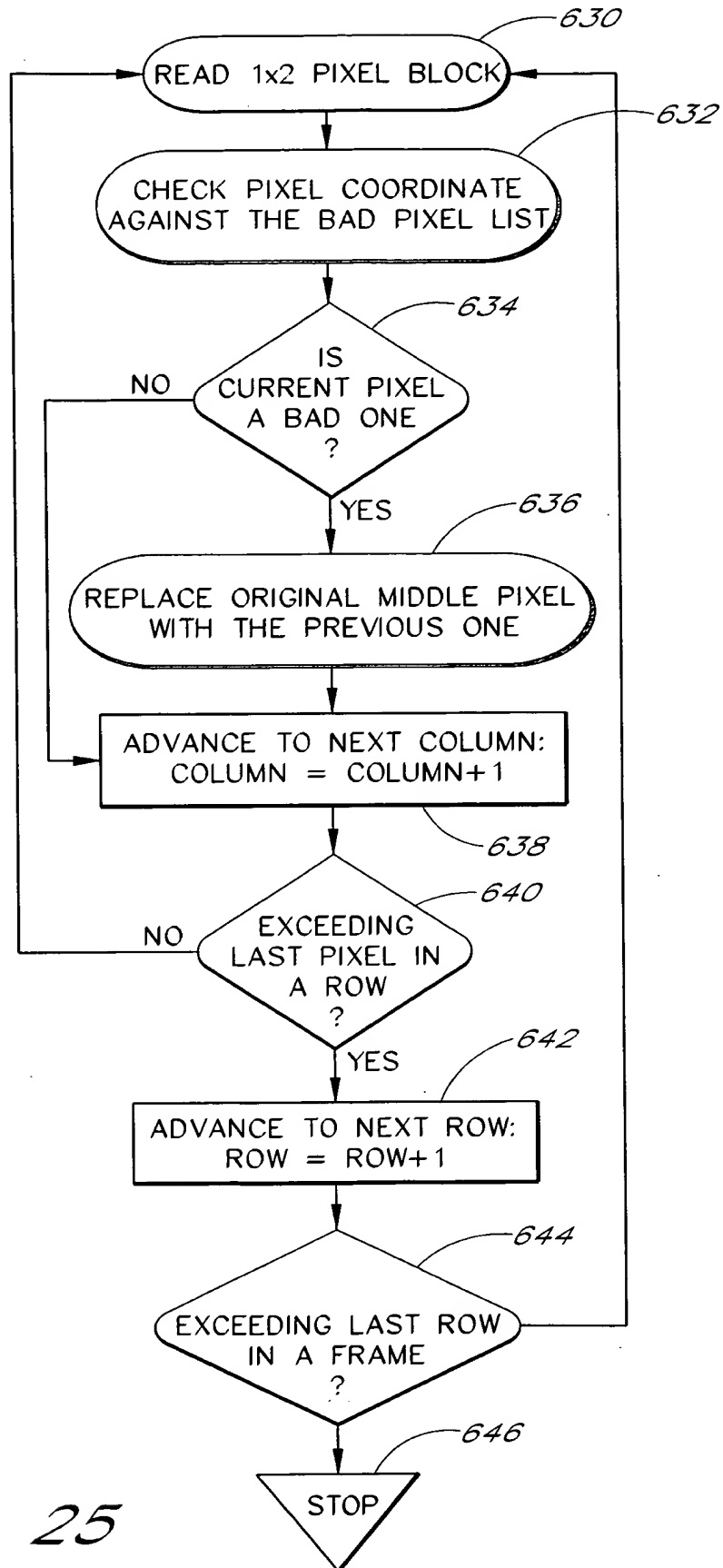


FIG. 25